

## ABSTRACT

A duo-binary encoder performs a parallel processing and an optical duo-binary transmission apparatus using the encoder to enhance transmission capability. The duo-binary encoder has a judgment unit for judging whether an odd number or even number of 5 '0's exists in data input signals of N channels, a toggle unit for toggling an output signal of the judgment unit when a number of '0's is even, an intermediate signal generation unit for determining whether phases of other channels are shifted or not, according to an data input signal on the basis of a predetermined channel of the N channels. A phase division unit divides data into a first data group having non-shifted phases and a second group of data 10 that require a phase shift, according to an output signal of the intermediate signal generation unit and the data input signal. The divided first and second data groups are then output.